Closed Loop Stabilization Kit

SYNRAD
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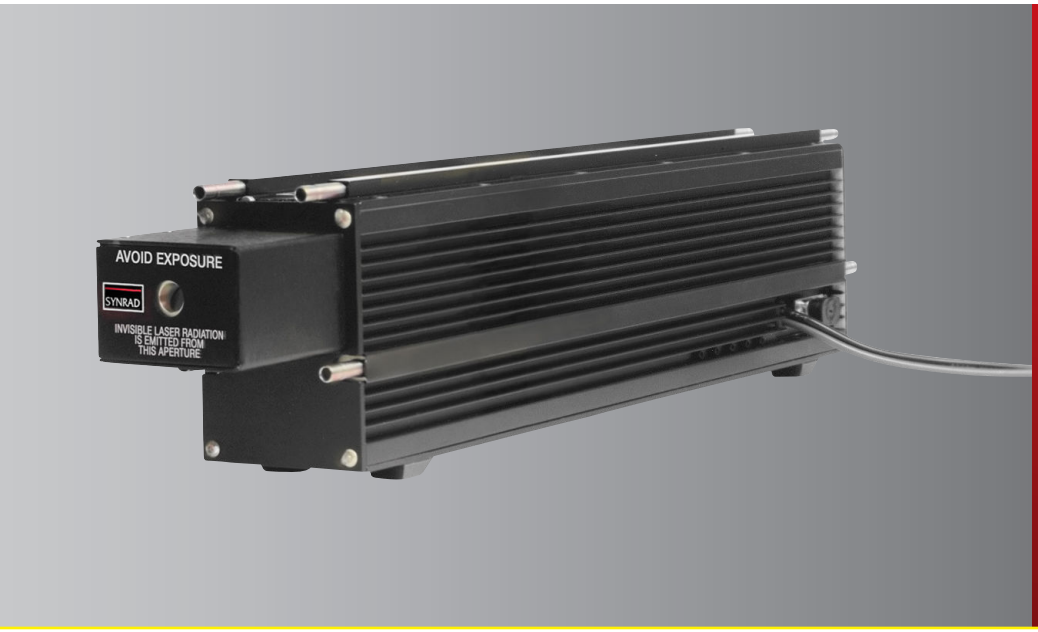


For use with Synrad's water cooled 48-1 and 48-2 lasers

Includes UC-2000 Controller

System performance typically ±2%

Synrad performance & reliability

Maximize power stability in your 48-1 / 48-2 laser processing applications.

The Closed Loop Stabilizer kits include a beam sampler and closed loop control system that stabilize the output power of Synrad's water-cooled 48-1 and 48-2 lasers. They are factory installed and include a UC-2000 Controller.

The optical sampler portion of the kit is attached to the front of the laser and replaces the standard end plate. The beam passes through the adapter with only a minor vertical displacement of the beam axis (less than .05"). There is no shift in beam direction.

A beamsplitter internal to the sampler diverts 8% of the output beam to a diffuser and thermo-pile detector. The thermo-pile detector signal is amplified within the sampling enclosure to a 1 to 12V signal level. A remotely located controller generates a variable duty cycle 5 kHz signal to maintain constant average power of the laser. On a custom basis, the control frequency can be raised to 20 kHz for less optical ripple.

The power "set point" can be adjusted on the UC-2000 to provide a laser output between approximately 20% and 80% of full power. This 20% window on either side of the range allows the UC-2000 to maintain full dynamic power regulation. Within the dynamic response time of the system, the UC-2000 can be gated from an external low frequency signal source. Servo settling time (to 90% of final value) is approximately 2 msec.

Performance of the system is typically ±2% even when the laser line hops between 10.57 and 10.63 µm. This accuracy is achieved by a combination of a wavelength insensitive beamsplitter and assured linear polarization of the signal impinging on the beamsplitter. The beamsplitter is a 45° oriented disc of ZnSe, AR coated on one side only. The optical input is provided through a Brewster angle polarizer, removing any residual orthogonally polarized components. The uncoated side of the ZnSe beamsplitter provides a wavelength independent signal used as sample input. Spatial non-uniformities of the beam are removed by reflecting the sampled signal from a metal grid diffuser before entering the broadband detector. The sampling detector has no window and has a flat black coating.

Power to the kit is provided from the UC-2000 Controller.

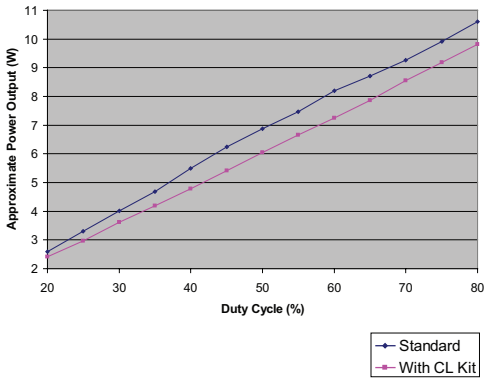
Specifications:

Optical Transmission	92 ± 1%
Input Power (optical)	150 W max.
Power Stability (guaranteed)*	± 2%
Control Range	20 - 80% of full output power
Servo Setting TIme (90%)	2msec (typical)
Control Frequency	5 KHz
Power Input (electrical)	12 VDC @ 3mA (from UC-2000)

Specifications subject to change without notice.

*Power instabilities are guaranteed not to exceed 2%

Representative Power Curve for 48-1 Laser



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